

Name: _____ Date: _____

Polynomial Operations EXAM (version 245)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = 10x^5 + 6x^4 + 8x^2 + 7x + 3$$

$$q(x) = 10x^5 - 4x^3 + 7x^2 - 5x + 6$$

Express the difference $p(x) - q(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = -8x^2 - 9x + 7$$

$$b(x) = -5x + 2$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^5$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned}f(x) &= 3x^3 - 21x^2 - 23x + 1 \\g(x) &= x - 8\end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x - 8}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R .

5. Let polynomial $f(x)$ still be defined as $f(x) = 3x^3 - 21x^2 - 23x + 1$. Evaluate $f(8)$.